

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 09/514,526

Applicant(s): Farquhar *et al.*

Filed: 02/28/00

Art Unit: 1746

Dkt. No.: **EN9000006US1**

Examiner: G. Winter

Title: **Accelerated Etching of Chromium**

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

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Sir:

This petition is being filed in response to the Final Office Action dated December 30, 2003.

**Petition Under 37 CFR § 1.181(a)(1)**

Applicants hereby petition for withdrawal of the objection to claims 20, 21, 29, 34, 36-40, and 42 contained in the Final Office Action dated December 30, 2003 on grounds that the objection is improper.

Applicants' authorized representative, Jack P. Friedman, discussed this issue with Examiner Gentle E. Winter in a telephone conversation on 02/26/2004. In said telephone conversation, Examiner Winter maintained his position that the objection is proper suggested that Applicants may file a petition if they so desire. As a result, Applicants are filing this petition to resolve this issue. Since prosecution of the above-mentioned patent application is not being stayed pending the decision on this petition, Applicants respectfully request a timely decision resulting from this petition.

### **Procedural Facts**

Following a Request For Continued Examination filed on 06/05/2003, an Office Action was mailed 07/09/2003 to which Applicants filed a response on 10/07/2003.

A Final Office Action rejection was mailed 12/30/2003 in which the Examiner introduced the objection to claims 20, 21, 29, 34, 36, 38-40, and 42. The present petition addresses said objection. Applicants have not yet responded to the Final Office Action mailed 12/30/2003.

### **Issue**

Whether the objection to claims 20, 21, 29, 34, 36, 38--40, and 42 in the Final Office Action mailed 12/30/2003 is proper.

### **Argument**

The Examiner argues: "Claims 20, 21, 29, 34, 36, 38-40, and 42 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. As has been discussed throughout the prosecution patentable weight will not be accorded to the method when the invention claims an apparatus. Applicant may elect to pursue an application claiming the invention in kit form or claim the invention as a method. Concentrations and temperatures are better-suited method types claims. Etch rates are usually meaningful only to the extent that there is an associated process step that results in the claimed etch rate. The claims are rejected with their base claims."

Applicants note that the Examiner's basic argument is that claims 20, 21, 29, 34, 36, 38-40, and 42 recite features which are method limitations in a structure claim and therefore

cannot be given patentable weight for further limiting the subject matter of a previous claim.

Applicants will next respond to the Examiner's basic argument for each of claims 20, 21, 29, 34, 36, 38-40, and 42.

Claims 20, 21, 29, and 39

Claims 20, 21, 29, and 39 each depend from claim 26. Claim 40 depends from claim 39 which depends from claim 26. Claims 26, 20, 21, 29, 39, and 40 are as follows:

26. An electrical structure, comprising:

- a chromium volume, wherein the chromium volume includes a layer of chromium;
- an iron-comprising body;
- an acid solution; and

- a layer of conductive metal on the layer of chromium, wherein the conductive metal includes an opening extending through its thickness, wherein a portion of the iron-comprising body is within the opening, wherein the portion of the iron-comprising body is in electrical contact with the chromium volume, and wherein a portion of the acid solution is within the opening, and wherein the portion of the acid solution is in contact with both the portion of the iron-comprising body and the chromium volume.

20. The electrical structure of claim 26, wherein the acid solution includes hydrochloric acid in a liquid bath form.

21. The electrical structure of claim 26, wherein the acid solution includes hydrochloric acid in a

spray form.

29. The electrical structure of claim 26, wherein the chromium volume includes the metallic chromium, wherein the acid solution includes hydrochloric acid, and wherein a temperature (T) and a molarity (M) of the hydrochloric acid is within a triangular space defined by (T,M) points of (21 °C, 2.4 M), (52 °C, 2.4 M), and (52 °C, 1.2 M).

39. The electrical structure of claim 26, wherein the acid solution is adapted to etch metallic chromium at a first etch rate in an absence of any present or prior contact between the metallic chromium and a body that includes iron.

40. The electrical structure of claim 39, wherein the acid solution is adapted to etch the chromium volume at a second etch rate that exceeds the first etch rate.

As to claim 20, Applicants respectively contend that claim 20 does not include any method limitation as alleged by the Examiner. Furthermore, the feature of “the acid solution includes **hydrochloric acid**” (emphasis added) is a limitation on the composition of the acid solution. The feature of “the acid solution includes hydrochloric acid **in a liquid bath form**” (emphasis added) is a limitation on the structural form of the acid solution. Either of the preceding two features of claim 20 further limits claim 26 from which claim 20 depends. Based on the preceding argument, Applicants respectfully maintain that the objection to claim 20 is improper and should be withdrawn.

As to claim 21, Applicants respectively contend that claim 21 does not include any method limitation as alleged by the Examiner. Furthermore, the feature of “the acid solution includes **hydrochloric acid**” (emphasis added) is a limitation on the composition of the acid solution. The feature of “the acid solution includes hydrochloric acid **in a spray form**” (emphasis added) is a limitation on the structural form of the acid solution. Either of the preceding two features of claim 21 further limits claim 26 from which claim 21 depends. Based on the preceding argument, Applicants respectfully maintain that the objection to claim 21 is improper and should be withdrawn.

As to claim 29, Applicants respectively contend that claim 29 does not include any method limitation as alleged by the Examiner. Furthermore, the feature of “wherein the chromium volume includes the **metallic chromium**” (emphasis added) is a limitation on the composition of the chromium volume. The feature of “the acid solution includes **hydrochloric acid**” (emphasis added) is a limitation on the composition of the acid solution. The feature of “wherein a temperature (T) and a molarity (M) of the hydrochloric acid is within a triangular space defined by (T,M) points of (21 °C, 2.4 M), (52 °C, 2.4 M), and (52 °C, 1.2 M)” is a limitation on the temperature and molar concentration of the acid solution.. Any one feature of the preceding three features of claim 29 further limits claim 26 from which claim 29 depends. Based on the preceding argument, Applicants respectfully maintain that the objection to claim 29 is improper and should be withdrawn.

As to claim 39, Applicants respectively contend that claim 39 does not include any method limitation as alleged by the Examiner. Furthermore, the feature of “wherein the acid

solution **is adapted to** etch the chromium volume at a second etch rate that exceeds the first etch rate” (emphasis added) is an intended use feature and not a method limitation. Applicants recognize that there is a question of patentable weight when an intended use appears in the preamble of a claim. However, the intended use feature in claim 39 appears in the body of the claim and not in the preamble, and therefore has patentable weight. Whether the intended use feature distinguishes over the prior art depends on whether the prior art recites structure that is capable of performing the intended use. However, whether the intended use distinguishes over the prior art is a statutory issue under 35 U.S.C. §102 or 35 U.S.C. §103 and is not relevant to the objection under consideration in the present petition. Therefore, the intended use feature in claim 39 has patentable weight for further limiting claim 26 from which claim 39 depends. Based on the preceding argument, Applicants respectfully maintain that the objection to claim 39 is improper and should be withdrawn.

As to claim 40, Applicants respectively contend that claim 40 does not include any method limitation as alleged by the Examiner. Furthermore, the feature of “wherein the acid solution **is adapted to** etch the chromium volume at a second etch rate that exceeds the first etch rate” (emphasis added) is an intended use feature and not a method limitation. See *supra* discussion of claim 39 as to why the intended use language in the body of claim 40 has patentable weight for further limiting claim 39 from which claim 40 depends. Based on the preceding argument, Applicants respectfully maintain that the objection to claim 40 is improper and should be withdrawn.

Claims 34, 36, and 38

Claims 36 and 38 each depend from claim 31. Claim 34 depends from claim 33 which depends from claim 31. Claims 31, 33, 34, 36, and 38 are as follows.

31. An electrical structure, comprising:

a chromium volume;

an iron-comprising body in electrical contact with the chromium an acid solution in contact with both the chromium volume and the iron-comprising body, wherein the acid solution is adapted to etch metallic chromium at a first etch rate in an absence of any present or prior contact between the metallic chromium and a body that includes iron.

33. The electrical structure of claim 31, further comprising a layer of conductive metal, wherein the chromium volume includes a layer of chromium, and wherein the layer of chromium is on the layer of conductive metal.

34. The electrical structure of claim 33, wherein the acid solution is not in contact with the layer of conductive metal.

36. The electrical structure of claim 31, wherein the chromium volume includes the metallic chromium, wherein the acid solution includes hydrochloric acid, wherein a temperature (T) and a molarity (M) of the hydrochloric acid is within a triangular space defined by (T,M) points of (21 °C, 2.4 M), (52 °C, 2.4 M), and (52 °C, 1.2 M).

38. The electrical structure of claim 31, wherein the acid solution is adapted to etch the chromium volume at a second etch rate that exceeds the first etch rate.

As to claim 34, Applicants respectively contend that claim 34 does not include any method limitation as alleged by the Examiner. Claim 34 includes the feature of “wherein the acid solution is not in contact with the layer of conductive metal”, which is a structural limitation and not a method limitation. Said feature of claim 34 further limits claim 33 from which claim 34 depends. Based on the preceding argument, Applicants respectfully maintain that the objection to claim 34 is improper and should be withdrawn.

As to claim 36, Applicants respectively contend that claim 34 does not include any method limitation as alleged by the Examiner. Furthermore, the feature of “wherein the chromium volume includes the **metallic chromium**” (emphasis added) is a limitation on the composition of the chromium volume. The feature of “the acid solution includes **hydrochloric acid**” (emphasis added) is a limitation on the composition of the acid solution. The feature of “wherein a temperature (T) and a molarity (M) of the hydrochloric acid is within a triangular space defined by (T,M) points of (21 °C, 2.4 M), (52 °C, 2.4 M), and (52 °C, 1.2 M)” is a limitation on the temperature and molar concentration of the acid solution.. Any one feature of the preceding three features of claim 36 further limits claim 31 from which claim 31 depends. Based on the preceding argument, Applicants respectfully maintain that the objection to claim 31 is improper and should be withdrawn.

As to claim 38, Applicants respectively contend that claim 38 does not include any



method limitation as alleged by the Examiner. Furthermore, the feature of “wherein the acid solution **is adapted to** etch the chromium volume at a second etch rate that exceeds the first etch rate” (emphasis added) is an intended use feature and not a method limitation. See *supra* discussion of claim 39 as to why the intended use language in the body of claim 38 has patentable weight for further limiting claim 31 from which claim 38 depends. Based on the preceding argument, Applicants respectfully maintain that the objection to claim 38 is improper and should be withdrawn.

#### Claim 42

Claim 42 depends from claim 41. Claims 41 and 42 are as follows.

41. An electrical structure, comprising:

a chromium volume;

an iron-comprising body in electrical contact with the chromium volume;

an acid solution in contact with both the chromium volume and the iron-comprising body;

and

a layer of conductive metal, wherein the chromium volume includes a layer of chromium, and wherein the layer of chromium is on the layer of conductive metal and in direct mechanical contact with the layer of conductive metal.

42. The electrical structure of claim 41, wherein the acid solution is not in contact with the layer of conductive metal.

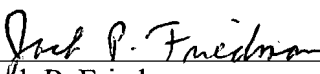
As to claim 42, Applicants respectively contend that claim 42 does not include any

method limitation as alleged by the Examiner. Claim 42 includes the feature of "wherein the acid solution is not in contact with the layer of conductive metal", which is a structural limitation and not a method limitation. Said feature of claim 42 further limits claim 41 from which claim 42 depends. Based on the preceding argument, Applicants respectfully maintain that the objection to claim 42 is improper and should be withdrawn.

**Summary**

In summary, Applicants respectfully petition for withdrawal of the objection to claims 20, 21, 29, 34, 36, 38-40, and 42 in the Final Office Action mailed 12/30/2003. Since prosecution of the present patent application is not being stayed pending the decision on this petition, Applicants respectfully request a timely decision resulting from this petition.

Respectfully submitted,

  
\_\_\_\_\_  
Jack P. Friedman  
Registration No. 44,688

Dated: February 27, 2004

Schmeiser, Olsen & Watts  
3 Lear Jet Lane - Suite 201  
Latham, New York 12110  
(518) 220-1850

61

AF/1746

**TRANSMITTAL LETTER**  
(General - Patent Pending)

Docket No.  
EN9000006US1

In Re Application Of: **Farquhar et al.**

Serial No.  
09/514,526

Filing Date  
2/28/00

Examiner  
G. Winter

Group Art Unit  
1746

Title: **ACCELERATED ETCHING OF CHROMIUM**

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Transmitted herewith is:

**Petition Under 37 CFR 1.181(a) (1) - 10 pages**

in the above identified application.

- ☐ No additional fee is required.
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09-0457(IBM)

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*Jack P. Friedman*  
Signature

Dated: 2/27/2004

Jack P. Friedman  
Reg. No. 44,688  
Schmeiser, Olsen & Watts  
3 Lear Jet Lane, Suite 201  
Latham, NY 12110  
(518) 220-1850

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*Kimberly Dwileski*  
Signature of Person Mailing Correspondence

Kim Dwileski

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